



Lesson: Monitoring Bird Phenology

Grade Level:

5th grade and up

Subject Areas:

Earth Science

Activity time: 30 minutes

Setting: Outdoors

Skills: Gathering information through observing; Analyzing information; Drawing conclusions.

Vocabulary:

- **Biomonitoring:** looking at a plant or animal over time that lives in a natural environment to check the quality of the ecosystem.
- **Climate:** the weather in a location over a long period of time. Mark Twain said, "Climate is what we expect, weather is what we get."
- **Climate Change:** a change in the world's climate.
- **Ecosystem:** combined physical and biological components of an environment.
- **Mnemonic:** a tool to used to help you remember something, usually verbal.
- **Phenology:** the study of weather, plant and animal life cycle events such as a flower's bloom, the first frost...
- **Weather:** the temperature, wind, clouds and precipitation information for a given day.

Objectives: Students will:

- 1) identify common birds found in fields or woodland areas;
- 2) learn and demonstrate one bird call for the field trip.

National Standards:

- Content Standard A: Science as Inquiry;
- Content Standard C: Life Science;
- Content Standard F: Science in Personal and Social Perspectives;

Materials:

- Bird call mnemonics
- Data Sheet

Background:

Climate Change and Bird Populations

Nearly 60% of the 305 species found in North America in winter are on the move, shifting their ranges northward by an average of 35 miles. Audubon scientists analyzed 40 years of citizen-science Christmas Bird Count data — and their findings provide new and powerful evidence that global warming is having a serious impact on natural systems. Northward movement was detected among species of every type, including more than 70 percent of highly adaptable forest and feeder birds. (birdsandclimate.audubon.org). See the map on page 3.

Birds are among the most adaptable of wildlife - as long as they can find suitable habitat, they are able to travel substantial distances north, inland, or to higher latitudes. That is one of the things that makes them

sensitive environmental indicators - alerting us to ecological disruption, often before it directly affects us. Audubon's new analysis reveals that many species that winter in the U.S. are moving significantly north - strong evidence that global warming is already altering their - and our - environment. However, Audubon's analysis also showed that some birds, including the majority of grassland species, are not following the trend — even as temperatures climb. For these species, disappearing habitat is taking an enormous toll and leaving them with nowhere to go - even as climate change is altering what habitat remains.

There is also concern over whether or not bird reproduction will stay in synch with maximum food abundance. A study in the Netherlands shows that the 90% decline of the Pied flycatcher is due in large part to the fact that its food source is no longer timed properly with the emergence of the caterpillar on which it feeds. <http://www.nature.com/nature/journal/v441/n7089/abs/nature04539.html>

Also when birds move to different habitats, there can be issues with new predators and competitors. Their major food and nesting items may no longer be available and new foods and habitats may be less than optimal.

Study Introduction:

A mnemonic is a tool used to help you remember something. It is very difficult to learn bird calls, so many scientists rely on mnemoics



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for help, especially when they are first learning a new bird. Below are several mnemonics for some common birds common at Purchase Knob in the Great Smoky Mountains National Park. Your job is to learn your assigned bird but to be familiar with the other birds to assist your classmates.

While visiting Great Smoky Mountains National Park you will be assisting with a modified point count. A point count is typically done in one spot for a specific time period to try and count the total number of different species and how many of each are heard. We will just be listening for the presence or absence of specific birds.

Procedure:

1: Have students memorize the mnemonic for their assigned bird(s).

2: Once out in the field in the phenology monitoring plot, have the students sit quietly in a circle with their backs facing in. They should listen for their bird but can record mnemonics for other birds on the list if they hear them.

Wrap Up:

Have the students think of other animals that might be impacted by changes in migration patterns due to climate change (Monarch butterflies, dragonflies, fish, mammals including whales...). Have them research things they can do to reduce their contributions to greenhouse gasses. There are great suggestions on the Audubon website [http://](http://birdsandclimate.audubon.org/WhatUCanDo.html)

birdsandclimate.audubon.org/WhatUCanDo.html

Assessment:

Students can be graded on their ability to match bird calls with the bird, how well they fill out the data sheet and research on their bird.

Extensions:

Monitor birds in your area as part of the National Phenology Network. Birds they monitor include American goldfinch, American robin, Black-capped chickadee, Brant, Cliff swallow, Common loon, Killdeer, Olive-sided flycatcher, Osprey and Scarlet tanager.

Resources:

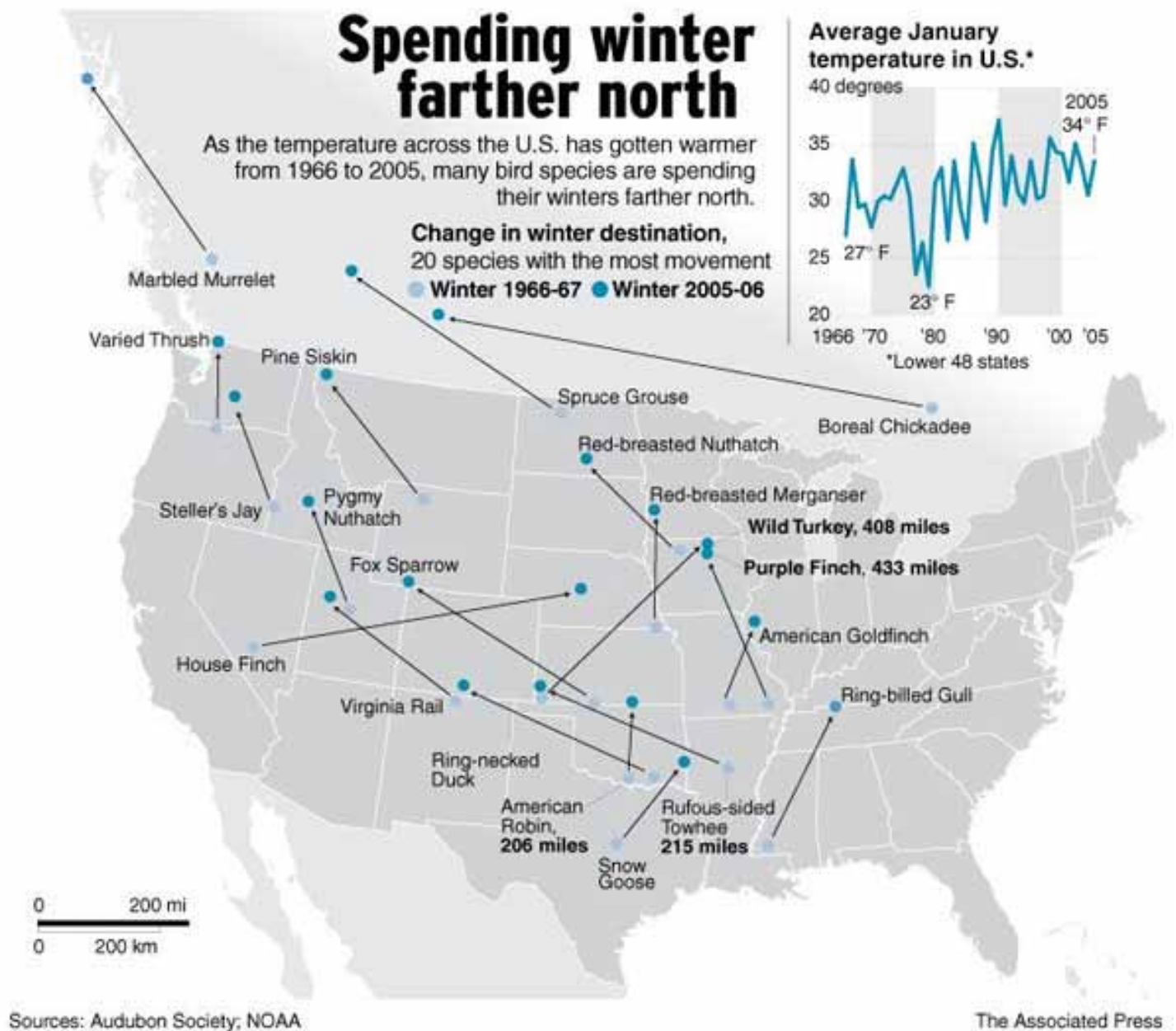
NPS Global Climate Change
<http://www.nps.gov/climatechange/>

NPS WebRangers Climate Change Activity
http://www.webrangers.us/activities/global_connect/?id=53

Do Your Part Parks
<http://www.doyourpartparks.org/>

National Phenology Network
<http://www.usanpn.org/>

Birds and Climate Change
birdsandclimate.audubon.org





Learn Your Bird Mnemonic Guide

Scientists rely on mnemonics for help, especially when they are first learning a new bird. Below are several mnemonics for some common birds common at higher elevations in the Great Smoky Mountains National Park. Your job is to learn your assigned bird in the first group and be familiar with the birds in the second section.

Most bird songs can be heard at the website from All-birds.com <http://www.all-birds.com/favorite-birds.htm>. (If viewed electronically, some songs are linked in the PDF).

Most Common Forest Birds - High Elevation in Great Smoky Mountains National Park

American Robin	“cheer-up, cheer-a-lee, cheer-ee-o”
Black-Capped Chickadee	“fee-bee” or “chk-a-dee-dee-dee”
Blue-Headed Vireo	“come here...jimmy...quickly”
Dark-Eyed Junco	“dit” quickly repeated, almost like a ringing telephone
Indigo Bunting	“fire, fire; here, here: quick, quick: put it out!, put it out!”

Other Common Forest Birds at High Elevations

Black-Throated Blue	“i am so laz-eeeeee”
Brown Thrasher	“drop-it, drop-it, cover-it-up, cover-it-up, pull-it-up, pull-it-up”
Common Yellow-throat	“witchity-witchity-witchity”
Chestnut-Sided Warbler	“pleased-pleased-pleased-pleased-ta-meetcha”
Gray Catbird	“meeeeee-ew” or “maaaanh” (nasal)
Red-Eyed Vireo	“where are you?” and “here I am”

Monitoring Life in Great Smoky Mountains National Park



Bird Phenology Data Sheet

Date:

Location:

Group Name:

Species Code:	Did You See/Hear...		Species Code:	Did You See/Hear...	
	Active Individuals	Y N ?		Active Individuals	Y N ?
	Calls or song	Y N ?		Calls or song	Y N ?
	Singing males	Y N ?		Singing males	Y N ?
	Fruit/seed consumption	Y N ?		Fruit/seed consumption	Y N ?
	Mating	Y N ?		Mating	Y N ?
	Nest Building	Y N ?		Nest Building	Y N ?
	Dead Individuals	Y N ?		Dead Individuals	Y N ?

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Species Code Chart

AMRO	American Robin	"cheer-up, cheer-a-lee, cheer-ee-o"
BCCH	Black-Capped Chickadee	"fee-bee" or "chk-a-dee-dee-dee"
BHVI	Blue-Headed Vireo	"come here...jimmy...quickly"
DEJU	Dark-Eyed Junco	"dit" quickly repeated, almost like a ringing telephone
INBU	Indigo Bunting	"fire, fire; here, here: quick, quick: put it out!, put it out!"
BTBL	Black-Throated Blue	"i am so laz-eeee"
BRTH	Brown Thrasher	"drop-it, drop-it, cover-it-up, cover it up, pull it up, pull it up"
CYTH	Common Yellow-throat	"witchity-witchity-witchity"
CSWA	Chestnut-Sided Warbler	"pleased-pleased-pleased-pleased-ta-meetcha"
GRCA	Gray Catbird	"meeeee-ew" or "maaaanh" (nasal)
REVI	Red-Eyed Vireo	"where are you?" and "here I am"